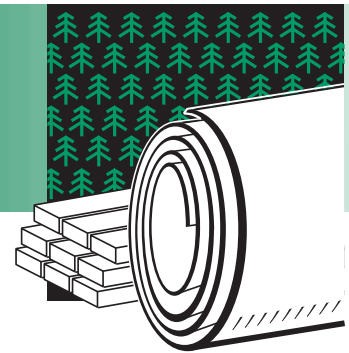


FOREST PRODUCTS

Project Fact Sheet



RADIOFREQUENCY-INDUCED VOC PRE-EXTRACTION FROM SOFTWOOD LUMBER

BENEFITS

- Reduction of VOCs from lumber and wood panel drying facilities
- Reduced control costs
- Reduced energy costs

APPLICATIONS

VOCs, principally turpentine (terpenes), emitted from softwood drying facilities are under present or pending legislation. Existing control technologies are both expensive and consume large amounts of natural gas. The results from this project will allow VOCs to be removed from wood prior to drying. Much lower emissions will then be realized during drying. The collected turpentine can be sold.

NEW PROCESS FOR VOC REMOVAL AND COLLECTION WILL BE TESTED AT THE PILOT SCALE

Volatile organic compounds (VOCs) are an important precursor to ground-level ozone formation, and as such are being increasingly regulated at the Federal and state level. Controlling VOC emissions from wood drying operations requires installation of expensive and energy-consuming add-on control equipment such as regenerative thermal oxidizers. New methods for removing VOCs from lumber and wood are needed that are less energy- and capital-intensive.

Recent research conducted by the Institute of Paper Science and Technology (IPST) has found that a brief radiofrequency (RF) treatment of softwood lumber removes over 70% of the VOCs (principally terpenes) from the wood without removing significant quantities of water. The VOC-depleted wood is then conventionally dried in lumber kilns with greatly reduced VOC emissions. The power requirements for RF pretreatment are very low since the RF field is not used to evaporate water, but only to maintain the wood at a set temperature under low-headspace conditions. The extracted terpenes (which are used in making turpentine and have a value of about \$1.40 per gallon) can be collected by condensing the small amount of steam released during treatment within the RF unit.

RADIOFREQUENCY UNIT



A charge of lumber loaded in a low-headspace vessel about to be processed in a Strayfield radiofrequency unit at Georgia Power's Technology Applications Center at Atlanta GA.



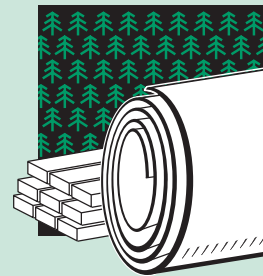
Project Description

Goal: Build, optimize, and document the costs and benefits of, a pilot-scale RF unit for removing and collecting VOCs from softwood lumber prior to conventional drying.

IPST will work together with technology vendors and forest products companies to build and test a pilot scale radiofrequency-induced VOC removal unit. A commercial-scale RF kiln will be modified to enable low-headspace work and to collect and condense the VOCs. Pilot-scale tests will be run to investigate and/or optimize such process parameters as energy use, uniformity of VOC extraction, wood quality, VOC collection efficiency, and turpentine yields. A computer model will be constructed to quantify the effect of RF on moisture and VOC loss from wood and its effects on the wood matrix. The VOC collection methodology will also be refined and the costs and benefits of the entire sequence will be determined.

Progress and Milestones

- The VOC reduction achievable from different furnishes has been demonstrated.
- Means to collect the VOCs from the low-headspace reactor have been developed.
- First-cut economics have been developed.
- Complete small-scale (70 kg) pilots have been run with lumber.
- Industrial partnerships for potential commercialization have been put together.



PROJECT PARTNERS

Institute of Paper Science
and Technology
Georgia-Pacific Corporation
Potlatch Corporation
Georgia-Power
American Kiln
Electric Power Research Institute

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